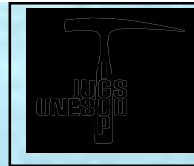




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Environmental Hazards in South Asia

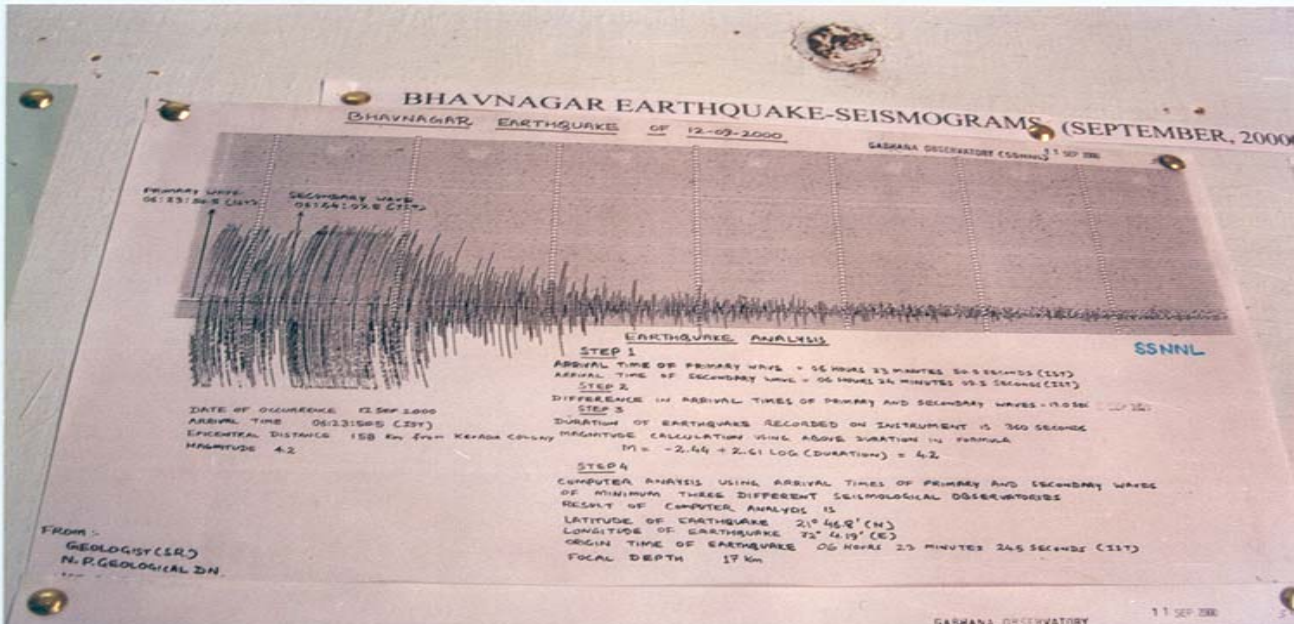
V. Subramanian

School of Environmental Sciences
Jawaharlal Nehru University
New Delhi - 110 067

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PREFACE

The South Asian region is prone to various types of natural hazards. Landslides due to natural causes of slope instabilities may also take place due to many man - induced factors such as deforestation and urbanisation. Besides the vagaries of erratic monsoon precipitation and melting glaciers, floods can also result due to slope instabilities and landslides. Conventional methods of hazard prediction and mitigation has to be supplemented by remote sensing techniques. Though many of the natural hazards have physical dimensions, they also have indirect effects on water quality since water is central to many of the hazards. Earthquakes, dams and safety of reservoirs and reliability of earthquake predictions to the safety of the habitats all form a part of understanding the natural hazards. Likewise, mining of natural mineral resources results in man - induced hazards such as land degradation, soil erosion and changes in water quality or broadly acid mine drainage problems. All these aspects of hazards not only affect the surface hydrology but also affect the sub-surface water domain both in respect of the quantity and quality.

Likewise, a large number of literature is available on the arsenic problem in the Bengal delta region but so far real life solution has evaded all the investigators as well as numerous agencies working in this region. Due to acid mine drainage problems, there are many areas in the sub continent that may effectively become part of the arsenic problem not too long in the distant future due to mining, smelting and processing of metals from sulphide mineral ore bodies scattered across the entire sub-continent. Though many scale model techniques have been tried to reduce the arsenic concentrations, due to lack of understanding on the fundamentals of the arsenic source and mobilisation, cost effective implementation of suitable technology to alleviate the sufferings of millions of affected population remains a distant dream. Factors controlling the enrichment of arsenic in the sub-surface waters, lateral spread of these arsenic rich waters are not yet understood so that cost effective in situ solution has evaded a number of funding agencies so far. While health aspects of the arsenic problem has been periodically highlighted with appealing photographs by a number of workers, remedial measures adapted so far are not reassuring to the general public.

This book is the result of contributions made by a number of experts on various aspects of environmental hazards including the much talked about arsenic problem in the Bengal delta region. Efforts have been made to incorporate as many case studies as possible, both regionally and subject wise to depict various types of natural geo environmental hazards. While there are speculations as to the origin of the arsenic problem, the end results so far has not given yet a viable field based solution as borne out by various individual authors of various sections in this book. The arsenic problem can be viewed as partly natural due to the proximity of many metallic mineral deposits in the hinterlands whereas the spatial extent of this problem suggests human impact due to excess withdrawal of sub-surface water thereby changing chemical regimes and mobilisation of the toxic element in the hydrosphere. Hopefully, these problems will receive serious attention of investigators in the years to come.

V. Subramanian

January 25, 2002



